

CLAIMS:

1. A valve assembly comprising:

5 a support ring having an outer surface and an inner surface;

a valve body comprising an annular body portion supporting a plurality of moveable leaflets that are moveable relative to the annular body portion and to each other between a first closed position and at least one second open position defining a  
10 first fluid pathway through the assembly when subject to a first pressure differential across the body;

wherein the annular body portion is mountable to the inner surface of the support ring and is relatively rotatable thereto;

15 and further wherein the annular body portion is moveable relative to the support ring from a sealed position to at least one unsealed position, the annular body portion and the support ring, in the unsealed position, together defining a second fluid pathway through the assembly.

20

2. A valve assembly for implantation in the cardio-vascular system of a human or animal subject, the valve assembly comprising:

a support ring having an outer surface and an inner surface, the outer surface  
25 being engageable with the wall of a vessel of the human or animal subject; and

a valve body comprising an annular body portion supporting a plurality of moveable leaflets that are moveable relative to the annular body portion and to each other between a first closed position and at least one second open position defining a  
30 first fluid pathway through the assembly when subject to a first pressure differential across the valve body;

wherein the annular body portion is mountable to the inner surface of the support ring and is relatively rotatable thereto;

35

and further wherein the annular body portion is moveable relative to the support ring from a sealed position to at least one unsealed position, the annular body portion and the support ring, in the unsealed position, together defining a second fluid pathway through the assembly.

5

3. The valve assembly of claim 1 or claim 2 wherein when the valve assembly is subjected to a second pressure differential, the plurality of leaflets move to their first closed position.

10 4. The valve assembly of any one of the preceding claims wherein the first pressure differential comprises a region of higher pressure upstream of the valve assembly relative to a lower pressure downstream of the valve.

15 5. The valve assembly of any one of the preceding claims wherein the second pressure differential comprises a region of lower pressure upstream of the valve assembly relative to a region of higher pressure downstream of the valve assembly.

20 6. The valve assembly of claim 1 or claim 2 wherein the annular body portion moves to its at least one unsealed position when the assembly is subjected to the first pressure differential.

25 7. The valve assembly of claim 6 wherein the annular body portion is not in engagement with the support ring in its unsealed position.

8. The valve assembly of any one of the preceding claims wherein the leaflets extend inwardly from and at an angle to the annular body portion when in their closed position.

30 9. The valve assembly of claim 8 wherein the leaflets together form a convex body that extends in a first direction away from the annular body portion when the leaflets are in their first closed position.

35 10. The valve assembly of any one of the preceding claims wherein at least one leaflet overlaps at least a portion of an adjacent leaflet when in their first closed position.

11. The valve assembly of any one of the preceding claims wherein the leaflets move progressively upon progressive change of pressure between the first pressure differential and the second pressure differential.
- 5
12. The valve assembly of any one of the preceding claims wherein at least one of the leaflets has a surface coating or the surface has been treated to reduce turbulence of fluid flowing past and/or over the leaflets.
- 10
13. The valve assembly of any one of the preceding claims wherein the moveable leaflets are hingedly connected to the annular body portion of the valve body.
14. The valve assembly of any one of claims 1 to 12 wherein the moveable leaflets are fixedly connected to the annular body portion of the valve body.
- 15
15. The valve assembly of any one of the preceding claims wherein the leaflets are made from a biological material selected from the group comprising autologous graft tissue, allograft tissue and xenograft tissue.
- 20
16. The valve assembly of any one of claims 1 to 14 wherein the moveable leaflets are made from an artificial material selected from the group comprising polymers, composites, metals and metal alloys including Nitinol™.
17. The valve assembly of any one of the preceding claims wherein the support ring
- 25 is made from a ceramic, a metal or a metal alloy material including a Cobalt-Chromium alloy.
18. The valve assembly of any one of the preceding claims wherein the annular body portion is made from a ceramic, a metal or a metal alloy material including a
- 30 Cobalt-Chromium alloy.
19. The valve assembly of any one of the preceding claims wherein the annular body portion includes a turbine member to optimise rotation of the annular body portion.
- 35

20. The valve assembly of any one of the preceding claims wherein the annular body portion and the support ring are provided as a single unit for implant into a system or subject.
- 5 21. The valve assembly of any one of claims 1 to 19 wherein the annular body portion and the support ring are provided as separate components.
22. The valve assembly of any one of the preceding claims when used to replace any valve of the cardiovascular system including the aortic valve, the pulmonary valve,  
10 the tricuspid valve and the mitral valve.
23. A valve for implantation in the cardio-vascular system of a human or animal subject, the assembly comprising:
- 15 a support ring having an outer surface and an inner surface, the outer surface being engageable with the wall of a vessel of the human or animal subject; and
- a valve body comprising an annular body portion supporting a plurality of leaflets that are moveable relative to the annular body portion and to each other, the  
20 leaflets being moveable between a first closed position and at least one second opened position defining a first fluid flow pathway through the assembly when subject to a first pressure differential across the body;
- wherein the annular body portion is mountable to the inner surface of the  
25 support ring and is relatively moveable from a sealed position to at least one unsealed position defining a second fluid pathway through the assembly when the assembly is subject to the first pressure differential.
24. The valve of claim 23 wherein the annular body portion is also relatively  
30 rotatable with respect to the support ring.
25. A method of implanting a valve assembly within the cardio-vascular system of a patient; the method comprising delivering the valve assembly of any one of claims 1 to 22 or the valve of claim 23 or claim 24 within a vascular vessel of the patient.
- 35

26. The method of claim 25 wherein the support ring is delivered separately to the valve body and as a first step.